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(54) Roller conveyor

(57) In a roller conveyor which includes a plurality of rollers (1) for transferring articles and driving means eg endless belt 3 for rotating the rollers (1), each of the rollers (2) comprises a centrally disposed driving member (1b) to which rotational force from the driving means is transmitted and a pair of outer transferring members (1c) on which the article is supported, the driving and transmitting members being frictionally and resiliently coupled to each other by a coupling means, eg by fluorin resin bushing 6 and compression spring 4.

The transferring members (1c) normally rotate along with the driving member (1b) but slide with respect to the driving member (1b) when the article is stopped, thereby preventing the abrasion of the transferring members (1c) of the roller (1). Thus, maintenance expenses of the roller conveyor and the time required for the repair are significantly reduced.

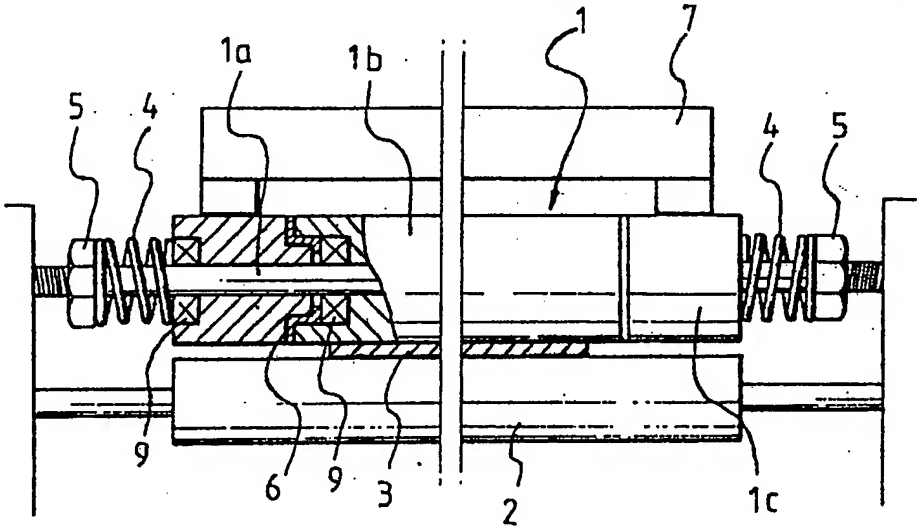

FIG. 3

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FIG. 1

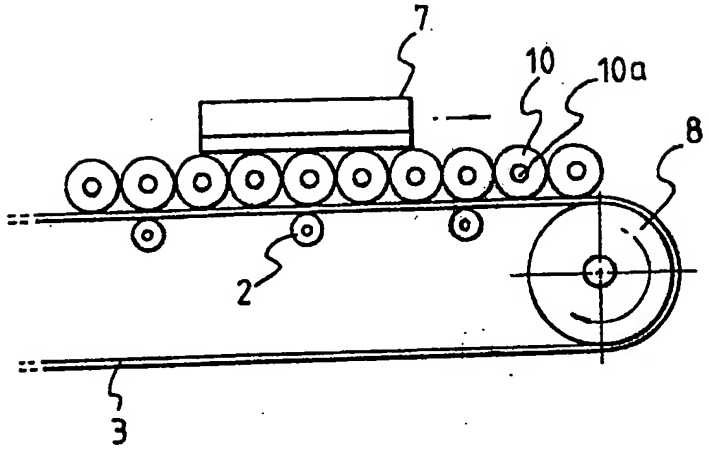


FIG. 2

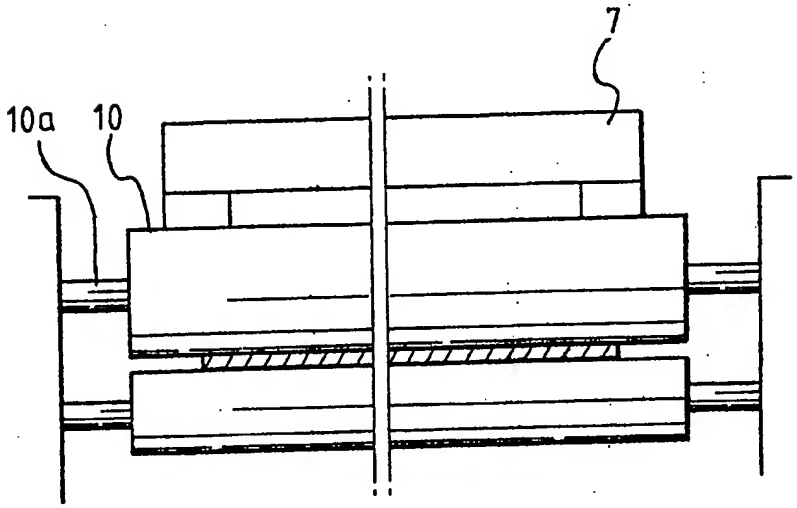
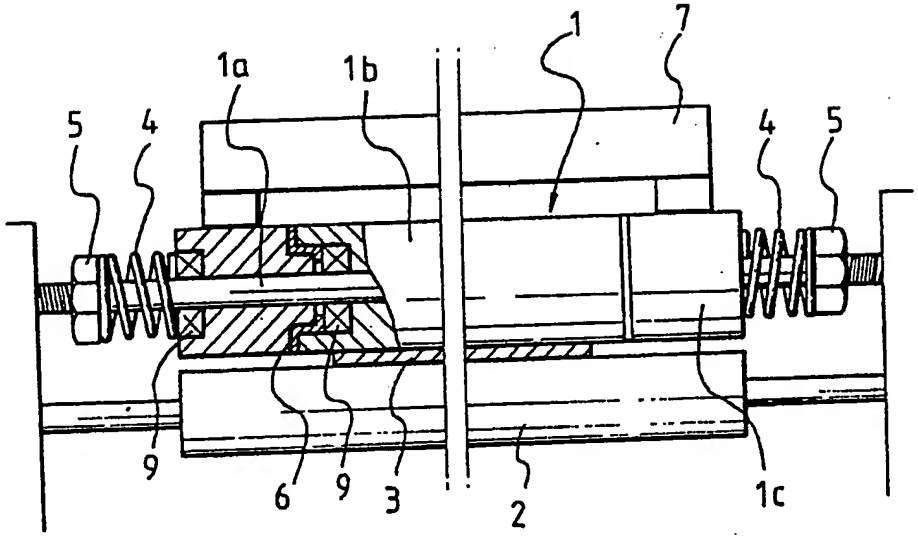


FIG. 3



ROLLER CONVEYOR

The present invention relates to a roller conveyor and in particular to an improved roller conveyor for conveying articles.

Generally, roller conveyors are used for conveying finished products at manufacturing lines or transferring semi-manufactured products produced at each work process to the subsequent process successively. The conventional roller conveyors include the type illustrated in FIG. 1 and FIG. 2 of the accompanying drawings. This conventional roller conveyor comprises a plurality of conveying rollers 10 rotatably installed around the axis 10a on which articles to be conveyed thereon are mounted, a belt 3 which transmits rotation force to the rollers 10 and a plurality of guiding rollers 2 therefor.

The conventional roller conveyor constructed as described above, makes it possible for articles 7 loaded on the conveying rollers 10 to be transferred, when the belt 3 supported by the guiding rollers 2 transmits rotational force to the conveying rollers 10 as the driving roller 8 starts to rotate by the driving source. (not shown)

Such a conventional roller conveyor has no problem in the course of transferring the articles, but friction occurs between the conveyed article 7 and the conveying rollers 10 in case of stopping the moving articles loaded on the rollers. Such a stoppage of moving articles on the conveying rollers is often made for

manufacturing and loading products at the production line and the stoppage of articles on the rotating conveying rollers is ordinarily made by a stopping means such as a stopper (not shown).

At this time, strong friction occurs between the transferred articles and conveying rollers as the conveying rollers continue to rotate regardless of the stoppage of the articles. Accordingly, the conveying rollers and conveyed articles are apt to be worn out due to the repeated friction and especially heavily worn conveying rollers should be replaced frequently.

Therefore, an object of the present invention is to provide an improved roller conveyor which can reduce undue friction between conveyed articles and conveying rollers.

According to the present invention, there is provided a roller conveyor including a plurality of rollers rotatably mounted around the respective axes for transferring articles and driving means for rotating the rollers, wherein each of the rollers comprises a centrally disposed driving member to which rotational force from the driving means is transmitted and a pair of outer transferring members on which the article to be conveyed is loaded. The driving and transferring members are frictionally and resilliently coupled to each other by a coupling means. The transferring members normally rotate along with the driving member but slide with respect to it when a predetermined strength of external force is exerted on the article to stop the same.

Embodiments of the present invention will now be described by way of example with reference to the accompanying

drawings in which:

FIG. 1 is a schematic view of a conventional roller conveyor;

FIG. 2 is a fragmentary cross-sectional view of the roller conveyor illustrated in FIG. 1, and

FIG. 3 is a fragmentary cross-sectional view (which corresponds to FIG. 2) of an embodiment of the roller conveyor according to the present invention.

An embodiment of the roller conveyor of the present invention is partially illustrated in FIG. 3 by a fragmentary crosssectional view, and its general structure is approximately the same as the conventional roller conveyor illustrated in FIG. 1.

A roller 1 is a characteristic feature of the present invention and basically comprises a centrally located driving member 1b cooperating with the transferring belt 3 and a pair of outer transferring members 1c which mount the conveyed articles 7 thereon. The roller further comprises a coupling means for frictionally and resilliently coupling the driving member 1b and the transferring members 1c with a predetermined pressure, which consist of a bolt 5, a compression spring 4 and a bushing 6. The above driving member 1b and the transferring members 1c are rotatably fitted on an axle 1a. Bearings 8 are interposed between the axle 1a and driving and transferring members.

The outer end of the transferring member 1a is urged by the spring 4 the compression force of which is adjusted by the bolt

5. A bushing 6 is interposed between the driving member 1b and the transferring member 1c, for frictionally coupling them under the compression force of the spring 4. Here, the bushing 6 serving as frictional coupler is preferably made of fluorine resin which is abrasion durable. However, the driving member 1b and the transferring member 1c in their contacting portion with the bushing 6 have greater hardness than the bushing to be more abrasion durable compared with the bushing. The compression force of the spring 4 is initially adjusted such that the transferring member 1a slides with respect to the driving member 1b upon exertion of external force above the predetermined level on the transferred article 7. Other portions of the roller conveyor are the same as the conventional one as described above in relation to Figs. 1 and 2, and thus detailed descriptions thereof are omitted.

The roller conveyor of this embodiment of the present invention operates as follows.

As the driving roller 8 rotates by means of a motor (not shown in the drawings), the belt 3 moves and transmits rotational force to the driving member 1b of the roller in cooperation with the guide roller 2. Since the transferring member 1c is frictionally coupled with the driving member 1b via the bushing 6, the transferring member 1c also revolves on the axle 1a as the driving member revolves, thereby transferring the article 7.

On the other hand, if some external force is exerted on the article to stop it, the transferring members 1c on which the article is loaded are also braked. Since this braking force is

greater than the coupling force applied between the driving and transferring members the transferring member 1c slides with respect to the driving member 1b.

Accordingly, the transferring member 1c is free from the rotation of the driving member 1b and stops, thereby obviating the frictional sliding with respect to the article 7.

As described above, in the roller conveyor of the present embodiment, the driving member 1b and the transferring member 1c of the roller 1 rotate together when the article 7 is transferred and the transferring member 1c stops rotating when the article 7 is stopped, preventing abrasion of the transferring member 1c.

If the frictional coupler, i.e., bushing 6 is worn out after long use and replaced by a new one, the roller conveyor can be used semi-permanently, thereby saving maintenance expenses of the roller conveyor. Further, the stoppage of the roller conveyor operation due to the repairs thereof may be prevented to increase the productivity.

CLAIMS

1. A roller conveyor comprising a plurality of rollers rotatably mounted on the respective axes thereof for transferring articles and driving means for rotating said rollers, wherein each of said rollers comprises a centrally disposed driving member to which rotation force from said driving means is transmitted and a pair of outer transferring members on which, in use, said article is loaded, said driving and transferring members being frictionally and resilliently coupled to each other by coupling means such that said transferring members normally rotate with the driving member but slide with respect to the driving member when an external force of predetermined magnitude is exerted on the article to stop the same.

2. A roller conveyor as recited in claim 1, wherein said coupling means comprises a friction means interposed between said driving and transferring members and a compression spring disposed on the axis of said roller and between said transferring member and a bolt to urge the outer end of the transferring member with a predetermined compression force.

3. A roller conveyor as recited in claim 2, wherein said friction means is a bushing made of friction durable resin.

4. A roller conveyor, substantially as hereinbefore

described with reference to Figure 3 of the accompanying drawings.

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